BY ORDER OF THE COMMANDER
AIR COMBAT COMMAND

AIR FORCE INSTRUCTION 21-103

AIR COMBAT COMMAND SUPPLEMENT

ADDENDUM_MM

25 MARCH 2014

Maintenance

EQUIPMENT INVENTORY, STATUS, AND UTILIZATION REPORTING SYSTEM/RQ-4B MINIMUM ESSENTIAL SUBSYSTEM LIST (MESL)

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

OPR: HQ ACC/A4C

Certified by: HQ ACC/A4C
(Col Charles D. Johnson)

Pages: 19

Supersedes: AFI 21-103_ACCSUP_ADD_MM, 18 August 2011

This MESL complements AFI 21-103, *Equipment Inventory, Status, and Utilization Reporting.* It applies to all Air Combat Command (ACC) RQ-4B units, including deployed locations. This supplement does not apply to the Air National Guard (ARG) and Air Force Reserve Command (AFRC). For the purpose of this instruction and development of maintenance policy, the Lead Command is Air Combat Command. As it pertains to weapon system specific issues or requirements, AFPD 10-9, Lead Command Designation and Responsibilities for Weapon Systems takes precedence. This publication may not be supplemented or further implemented or extended. ACC/A4C serves as the approval authority for waiver requests for this publication (waiver requests for this publication must be submitted to the OPR for the supplement). Send recommended changes or comments on AF Form 847, *Recommendation for Change of Publication***,** to HQ ACC/A4YQ, 130 Andrews St, Suite 211, Langley AFB VA 23665-2791, and send information copies to the applicable OCR. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) AFMAN 33-363, *Management of Records*, and disposed of IAW the Air Force Records Information

Management System (AFRIMS) Records Disposition Schedule (RDS). Contact supporting records managers as required.

SUMMARY OF CHANGES

This publication is substantially revised and must be completely reviewed. Specifically the Mission columns have been changed. Numerous systems Work Unit Codes (WUCs) have been added or deleted. Remarks are incorporated for each applicable WUC and have replaced notes to better clarify mission capability requirements.

1. Roles and Responsibilities.

1.1. The Production Superintendent with input from the Aircraft Operator and Sensor Operator will determine appropriate status prior to reporting.

2. General. The MESL is the basis of status reporting IAW AFI 21-103. MESLs lay the groundwork for reporting aircraft availability status. MESLs list the minimum essential systems and subsystems that must work on an aircraft for it to perform specifically assigned unit wartime, training, test or other missions. MESLs are not comprehensive WUC lists and not intended to mirror Minimum Equipment Lists. Use Mission Ready Available (MRA) in readiness Status of Resources and Training System (SORTS) reporting only, and it denotes Mission Capable (MC) aircraft capable of configuration for a contingency mission IAW COMACC OMNIBUS Plan.

2.1. Qualifying notes are used to define aircraft exceptions and help explain complex degraded mission systems.

2.2. Aircraft status for generation and deployment: The goal is to generate or deploy Fully Mission Capable (FMC) aircraft, recognizing status actually achieved may be less than FMC. A Not Mission Capable (NMC) aircraft may deploy provided it is safe for flight and can be configured and generated to MRA status at an employment site.

2.3. All ACC units will generate, or deploy and regenerate, using ACC MESLs. Major Command (MAJCOM) differences in MESLs are acknowledged. Upon actual deployment to another MAJCOM theater, the gaining MAJCOM has the responsibility to resource and specify the unit's requirements and resource the differences in support/mission equipment.

3. Reading the MESL. Read a MESL by comparing the systems stated by WUC against the Full System List (FSL) and all applicable Basic System Lists (BSLs) across the page. Each unit's Design Operational Capability (DOC) statement determines applicability of BSL columns. The aircraft MESLs incorporate all ACC assigned aircraft; therefore, it is important to compare only those columns listed in the MESL that are applicable to the unit's assigned aircraft. For example, units with Primary Mission Aircraft Inventory (PMAI) coded aircraft would determine and report status using only the FSL and BSL columns related to their DOC statement. Units with Primary Training Aircraft Inventory (PTAI) coded aircraft would determine and report status using only the FSL and TNG columns, and units with Primary Development/Test Aircraft Inventory (PDAI) coded aircraft would determine and report status using only the FSL and Test (TST) columns. Units with multiple coded aircraft will ensure reported status by using the MESL columns appropriate to the individual aircraft assignment code. Note: Until a DOC statement is published, utilize the FSL, RT and CT columns for determining aircraft status.

Table 1. RQ-4B MESL.

NO.	WUC	SYSTEM/SUBSYSTEM	EISS EO/IR	EISS SAR	FSL	BSL			
						RT	TST	Tng-L	Tng-M
1.	11	Airframe			X	X	X	X	X
2.	13	Landing Gear			X	X	X	X	X
3.	14	Flight Controls			X	X	X	X	X
4.	19	Engine Starting			X	X	X	X	X
5.	23	Turbofan Engine			X	X	X	X	X
6.	39	Ice Detection			X	X	X	X	X
7.	41	Environmental Control			X	X	X	X	X
8.	42	Electrical Power			X	X	X	X	X
9.	44	Lights			X	X1	X1	X1	X1
10.	45	Hydraulic and Pneumatic Systems			X	X	X	X	X
11.	46	Fuel System			X	X	X	X	X
12.	57A	Flight Environment Data			X	X	X	X	X
13.	57BA0 A/B/C/D	Radio Altimeter System			X	X	X	X	X

14.	57BB0 A/B/C/D/E	SCAT-1 Differential GPS (DGPS)			X8	X8	X8	X8	X8
15.	57BC0 A/B/C/D/E	Global Positioning System (GPS) System			X	X	X	X	X
16.	57BD0	OmniSTAR			X8	X8	X8	X8	X8
17.	57BE0	Forward Looking Infrared (FLIR)			X2	X2	X2	X2	X2
18.	57CA0	Inertial Navigation (Kearfott and			X	X	X	X	X
19.	57CC0 A/B/C				X2/7	X2/7	X2/7	X2/7	X2/7
20.	57CD0 A/B	Global Air Traffic Management System			X2/7	X2/7	X2/7	X2/7	X2/7
21.	57D	Processing and Integration			X	X	X	X	X
22.	57HA/B	Integrated Mission Management Computers (IMMC)			X	X	X	X	X
23	57HC	Ethernet Hub			X	X	X	X	X
24.	62,63	UHF/VHF (Voice) Communications			X3	X3	X3	X3	X3
25.	65	Identification Friend or Foe (IFF)			X	X	X	X	X
26.	66	Emergency Locator Transponder			X	X	X	X	X
27.	68	Data Links			X	X4/5	X4/5	X4	X4/5
28.	77A	Electro-optical (EO)/Infrared (IR)			X 12				

	77AA0	Enhanced Integrated Sensor Processor	X	X	X	X	X	X	X
	77ACO	Enhanced Sensor Electronics Unit (ESEU)	X	X	X4/13	X4/13	X4/13	X4/13	X4/13
	77AHO	Enhanced EO/IR Receiver Unit (ERU)	X		X	X	X	X	X
29.	77AK	Synthetic Aperture Radar (SAR)			X 12				
	77AKA	Enhanced SAR Antenna (EANT)	X	X	X	X	X	X	X
	77AKB	Enhanced SAR Transmitter (EXMTR)	X	X	X	X	X	X	X
	77AKC	Enhanced SAR Receiver Exciter Controller (EREC)	X	X	X	X	X	X	X
	77AE0	Enhanced Power Distribution Unit	X	X	X	X	X	X	X
30.	91	Emergency Equipment	X	X	X	X	X	X	X

BSL – Basic System List

EISS EO/IR – Enhanced Integrated Sensor Processor Electric Optical/Infrared

EISS SAR– Enhanced Integrated Sensor Processor Synthetic Aperture Radar

FSL – Full System List

RT – Reconnaissance Tactical

TST – A test mission flown under the guidance of either AFFTC or 53 TW

Tng-L – Applies to aircraft/control segments supporting pilot basic qualification training missions
Tng-M – Applies to aircraft/control segments supporting full aircrew (pilot and sensor operator) mission qualification training missions
QUALIFYING NOTES:
1. As required by AFI 11-218, *Aircraft Operations and Movement on the Ground* and AFI 11-202 V3, *General Flight Rules*.
2. As required by airspace management authorities.
3. Aircrew will have direct (line-of-sight) or indirect (audio pass-through or A.M. relay) radio communication capability with air traffic control. Based on mission criticality and the availability of alternate means of communication, operations may elect to fly without this capability.
4. Aircraft must have operational C2 equipment capable of supporting two links for all portions of all missions.
5. At least one broadband data link is required for each sensor mission.
6. If sensor payload can be operated/flown without damaging EISS, the aircraft is PMC if either SAR or EO/IR is operational.
7. When Installed and required for assigned mission.
8. Either SCAT-1 or OmniSTAR DGPS corrections are required for all taxi, takeoff & landing events.
9. Refer to attachment 2 for Airborne Signals Intelligence Payload (ASIP) M/C criteria.
10. Refer to attachment 3 for Battlefield Airborne Communications Node (BACN) M/C criteria.
11. Refer to attachment 4 for Multi-Platform Radar Technology Insertion Payload (MP-RTIP) M/C Criteria.
12. Not Applicable on Block 20 BACN or Block 40 MP-RTIP.

13. NMC if ESEU Removed:
- EERU does not get 28VDC, heaters are unpowered and EERU gets cold soaked during flight.
- SAR Antenna has no gimbal drive control (provided by the ESEU) and is unusable.

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Director of Logistics

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 11-202V3, *General Flight Rules*, 22 October 2010

AFI 11-218, *Aircraft Operations and Movement on the Ground*, 28 October 2011

AFI 21-103, *Equipment Inventory, Status, and Utilization Reporting*, 26 January 2012

Prescribed Forms

This supplement does not prescribe any forms.

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

ACC—Air Combat Command or Air-cooled Chassis

ASIP—Airborne Signals Intelligence Payload

BACN—Battlefield Airborne Communications Node

BLOS—Beyond-Line-of-Sight BSL—Basic System Lists

C2—Command and control CDL—Common Data Link

DGPS—Differential Global Positioning System

DLE—FSE—Data Link Encryptor – File Server Encrypted

DOC—Design Operational Capability EAU—ELINT Antenna Unit

EFS—Encrypted File Server

EO—Electro-optical

FLIR—Forward Looking Infrared

FMC—Full Mission Capable

FSL—Full System List

GPS—Global Positioning system

IAW—In Accordance With

LOS—Line-of-Sight

IFF—Identification Friend or Foe

IMMC—Integrated Mission Management Computers

IR—Infrared

MAJCOM—Major Command

MC—Mission Capable

MESL—Minimum Essential Subsystem List

MP—RTIP—Multi-Platform Radar Technology Insertion Program

MIMPS—Modular Integrated Mobile Power Systems

MRA—Mission Ready Available

NMC—Not Mission Capable

PDAI—Primary Development/Test Aircraft Inventory

PFR—Precision Frequency Reference

PMAI—Primary Mission Aircraft Inventory

PTAI—Primary Training Aircraft Inventory

RDS—Records Disposition Schedule

RT—Reconnaissance Tactical

SAR—Synthetic Aperture Radar

SCC—Spray-cooled Chassis

SORTS—Status of Resources and Training System

TFT—Tactical Field Terminal

TIGDL—Tactical Interoperable Ground Data Link

TST—Test

WUC—Work Unit Code

Attachment 2

ASIP MESL

A2.1. The table below, **Table A2.1**, applies to the Airborne Signals Intelligence Payload (ASIP) components of the block 30M aircraft. The ASQ-230 is designed with Built–in-Test (BIT), allowing the FSRs to evaluate the internal signals in all the ASIP LRUs, at the sub-WUC level. System redundancy and a detailed fault isolation tree allow the operational unit to assess the degradation of the ASQ-230 LRUs and provide recommendations based on mission requirements. The number of receivers and processors available to the operator is normally in excess of what is required for the mission. Any of the AN/ASQ-230(v) chassis can be degraded and still be mission capable. Partial Mission Status can be extrapolated by column for the desired system capability. "X" maps require subsystem to system function Non-operational ASIP equipment not required for the mission/training does not render the aircraft non-flyable. If sensor payload can be operated/flown without damaging either ASIP/EISS system, the aircraft is PMC, given that one of the systems is operational. See RQ-4B MESL items 28 and 29.

Table A2.1. ASIP MESL.

No	WUC	System / Subsystem	ASIP TCS	ASIP TAS	ASIP Special Signals	ASIP High Band	FSL	BSL			
								RT	TST	Tng- L	Tng- M
1.	77B	AN/ASQ-230(V)					**X1/2**				
2.	77BA	Blade Ant Unit (BAU) (x 7)	X	X	X		X3	X3	X3	X3	X3
3.	77BB / BC	ELINT Ant Unit (EAU) (x 2)			X	X	X4	X4	X4	X4	X4
4.	77BG	SCC1 Band Converter	X	X	X	X	X5	X5	X5	X5	X5
5.	77BH	SCC2 Wideband Pulse Recover				X	X6	X6	X6	X6	X6
6.	77BK	ACC3 Special Signals	X	X	X	X	X7/8	X7/8	X7/8	X7/8	X7/8
7.	77BL	ACC4 TCS	X				X8/9	X8/9	X8/9	X8/9	X8/9
8.	77B M	ACC5 TAS	X	X			X8/10	X8/10	X/10	X8/10	X8/10
9.	7BN	ACC6 RF Distribution	X	X	X	X	X11	X11	X11	X11	X11
10.	77BJ	Digital Junction Box (DJB)	X	X	X	X	X	X	X	X	X

11.	77BE	Data Link Encryptor/File Server Encryptor (DLE/FSE)	X	X	X	X	X	X	X	X	X
12.	77BF	Encrypted File Server (EFS)	X	X	X	X	X	X	X	X	X
13.	77BP	Precision Frequency Reference (PFR)	X	X	X	X	X	X	X	X	X

BSL – Basic System List

FSL – Full System List

RT – Reconnaissance Tactical

TAS – The Agile Signal

TCS – The Common Signal

TST – A test mission flown under the guidance of either AFFTC or 53 TW

Tng- L – Applies to aircraft/control segments supporting pilot basic qualification (Launch and Recovery Element only) training mission

Tng-M – Applies to aircraft/control segments supporting pilot mission qualification training missions

QUALIFYING NOTES:

1. Not applicable on Block 20 BACN or Block 40 MP-RTIP.

2. PMC if EISS System, WUC 77A is NMC.

3. PMC with one or more antennas can be lost. One antenna must remain operational to fully support the ASIP Low Band "collection" capability. One or more antennas can be degraded, non-functional, or removed. The number of blade antennas that are degraded affects the accuracy of the Low Band "DF/geo-location" capability. Under these conditions the ASIP System's Low Band "DF/geo-location" capability is partially mission capable.

4. PMC One of the antennas can be degraded, non-functional, or removed and replaced by ballast, and ASIP can continue to perform its High Band mission in a degraded status.

5. SCC1 can be degraded and still full mission capable depending on Commander's assessment of mission need.

6. PMC if SSC2 is degraded, non-functional, or removed. The ASIP Low Band capability remains fully mission capable.

7. ACC3 can be degraded and still full mission capable depending on Commander's assessment of mission need.
8. Aircraft ballast is not sufficient to allow the removal of two or more aft ASIP LRUs (ACC3, ACC4 and ACC5) at the same time. Weight and balance computations are the driving factor whether a chassis should be removed.
9. PMC if ACC4 is degraded, non-functional, or removed. The High Band and the Low Band TAS capability will remain fully mission capable.
10. PMC if ACC5 can be degraded, non-functional, or removed. The High Band capability will remain fully mission capable.
11. ACC6 can be degraded and still full mission capable depending on Commander's assessment of mission need.

Attachment 3

BACN MESL

A3.1. Non-operational BACN equipment not required for the mission/training does not render the aircraft non-flyable.

Table A3.1. BACN MESL.

				BSL			
NO.	**WUC**	**SYSTEM/SUBSYSTEM**	**FSL**	**CT**	**Test**	**Tng-L**	**Tng-M**
1.	69	Battlefield Airborne Communications Node (BACN) Payload	X	X1/8	X1/8	X1/8	X1/8
2.	69A	Power Control/Distribution	X	X	X	X	X
3.	69B	Airborne Executive Processor (AEP)	X	X2	X2	X2	X2
4.	69C	RF Equipment Group	X	X	X	X	X
5.	69CA	UHF/VHF Radios (AN/ARC-210)	X	X3	X3	X3	X3
6.	69CAA	RF Amplifier	X	X4	X4	X4	X4
7.	69CB	Link-16	X	X5	X5	X5	X5
8.	69CC	SADL/EPLRS	X	X6	X6	X6	X6
9.	69CD	T-CDL	X	X7/8	X7/8	X7/8	X7/8
10.	69CE	INMARSAT	X	X8	X8	X8	X8
11.	69CF	802.11 Wireless	X	X8	X8	X8	X8
12.	69CG	HAIPE System (KG-250)	X	X	X	X	X
13.	69D	Global Positioning System (GPS)	X	X	X	X	X
BSL – Basic System List							
FSL – Full System List							
CT – Communication Tactical							

RT – Reconnaissance Tactical
Test – A test mission flown under the guidance of either AFFTC or 53 TW
Tng-L – Applies to aircraft/control segments supporting pilot basic qualification (LRE only) training missions
Tng-M – Applies to aircraft/control segments supporting full aircrew (pilot and sensor operator) mission qualification training missions
BACN – Applies to aircraft/control segments supporting BACN-equipped missions (pilot and BACN payload operator)
PCE-L – Payload Control Element– Launch
PCE-M – Payload Control Element– Mission
QUALIFYING NOTES: 1. Payload must have operational PCE-L and PCE-M capable of supporting BLOS and LOS C2 links for all portions of mission. 2. PMC if Voice Board/VOIP distribution is inoperable. 3. NMC, if six (6) ARC-210 radios are inoperable; PMC, if five (5) or less are inoperable. 4. PMC, if inoperable. 5. PMC, if two Link-16 Radio are inoperable. 6. PMC, if one SADL/EPLRS radio is inoperative. 7. PMC, if inoperable and two (2) BACN payload C2 links are operable (T-CDL/ARC-210 UHF LOS). 8. PMC, if ARC ARC-210 LOS BACN payload C2 link is operable.

Attachment 4

MP-RTIP MESL

A4.1. Non-operational MP-RTIP equipment not required for the mission/training does not render the aircraft non-flyable. This table, **Table A4.1**, will require revalidation after field-testing and/or OT&E.

Table A4.1. MP-RTIP MESL.

NO.	WUC	SYSTEM/SUBSYSTEM	FSL	BSL			
				RT	TST	Tng-L	Tng-M
1.	77CA	Antenna Assembly	X	X	X	X	X
2.	77CB	Array Power Conditioner Unit (APCU)	X	X	X	X	X
3.	77CF/G/ H	Low Noise Amplifier (LNA)/Limiter	X	X	X	X	X
4.	77CK	Clock Translator	X	X	X	X	X
5.	77CL	Support Electronics Assembly (SEA)	X	X	X	X	X
6.	77CS	Receiver Exciter (REX)	X	X	X	X	X
7.	77CT	REX Power Supply	X	X	X	X	X
8.	77CU	Radar Processor Assembly (RPA)	X	X	X	X	X
9.	77CV	Radar Processor/Radar Control Unit, Low Voltage Power Supply (RP/RCU LVPS)	X	X	X	X	X
10.	77CW	Antenna Drive System Controller (ADSC)	X	X	X	X	X
11.	77CY	Airborne Database Computer (ADC)	X	X	X	X	X
BSL – Basic System List							
FSL – Full System List							
RT – Reconnaissance Tactical							
TST – A test mission flown under the guidance of either AFFTC or 53 TW							
Tng-L – Applies to aircraft/control segments supporting pilot basic qualification (Launch and Recovery Element only) training missions							
Tng-M – Applies to aircraft/control segments supporting pilot and sensor operator mission qualification training missions							

NO.	WUC	SYSTEM/SUBSYSTEM	FSL	BSL			
				RT	TST	Tng-L	Tng-M
QUALIFYING NOTES:							